

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

- 1           1. (currently amended) A data management method, comprising:  
2           using an operating system, operating a source volume of a source device wherein  
3           the source volume includes storage, a plurality of user files stored in said storage and a  
4           file system for locating said user files stored in said storage, said file system including an  
5           address table identifying the location of each file on said storage device, said operating  
6           including said operating system locating said user files in said storage using said file  
7           system and said address table of said file system;  
8           backing up contents of a the source volume of the source device at a first client  
9           station as at least one object of a database stored in a data storage subsystem wherein the  
10          at least one object represents an image of the contents of the source volume of the source  
11          device ~~and wherein the image of the contents of the source device includes a plurality of~~  
12          ~~files and a file directory of the source device;~~  
13          using the database, tracking attributes and location of the at least one object in the  
14          database;  
15          using the at least one object, restoring the contents of the source volume of the  
16          source device from the at least one object to at least one record of a target file in a file  
17          system stored on a storage device instead of to a volume being operated as a volume by  
18          an operating system so that the at least one record of the target file contains internally  
19          within said at least one record of said target file, image data representing said contents of  
20          the source volume ~~device~~ including image data representing both said plurality of files  
21          and said file system ~~directory~~ of the source volume within said at least one record of said  
22          target file ~~device wherein said file system comprises a plurality of files and an address~~  
23          ~~table identifying the location of each file on said storage device;~~

24           using an operating system, using the target file containing the image data as a file  
25   instead of a volume so that the target file is not operated as a volume by an operating  
26   system; and  
27           copying image data representing the ~~restored~~ contents of the source volume device  
28   from the at least one record of the target file to a target volume of a target device so that  
29   the target volume device contains the restored contents of the source volume device  
30   including said plurality of files of the source volume device and said file system directory  
31   of the source volume device; and  
32           using an operating system, operating the target volume as a volume, including  
33   locating said user files in said target volume using said file system of said target volume  
34   so that the target volume is operated as a volume instead of a file by an operating system.

1           2. (previously presented) The method of claim 1 wherein the target file is stored  
2   on storage media at a second client station.

1           3. (currently amended) The method of claim 1 wherein the target file is a flat file  
2   which contains in a single record of the flat file the image data representing the complete  
3   contents of the source volume device.

1           4. (cancelled)

1           5. (original) The method of claim 1 wherein the data storage subsystem includes  
2   a server coupled to the first client station by a network.

1           6. (original) The method of claim 1 further comprising, using the at least one  
2   object, restoring the contents of the source device from the at least one object to a target  
3   device so that the target device contains the contents of the source device.

1           7-9. (cancelled)

1           10. (original) The method of claim 1 further comprising mounting the source  
2 device as a read only device wherein write operations to said source device are prevented  
3 during said backing up of said source device.

1           11. (previously presented) The method of claim 1 wherein said target file is a flat  
2 file.

1           12. (original) The method of claim 1 wherein said copying uses the UNIX dd  
2 command.

1           13-36. (cancelled)

1           37. (currently amended) An article of manufacture for data management,  
2 wherein the article of manufacture causes operations to be performed, the operations  
3 comprising:

4           using an operating system, operating a source volume of a source device wherein  
5 the source volume includes storage, a plurality of user files stored in said storage and a  
6 file system for locating said user files stored in said storage, said file system including an  
7 address table identifying the location of each file on said storage device, said operating  
8 including said operating system locating said user files in said storage using said file  
9 system and said address table of said file system;

10          backing up contents of ~~a~~ the source volume of the source device at a first client  
11 station as at least one object of a database stored in a data storage subsystem wherein the  
12 at least one object represents an image of the contents of the source volume of the source  
13 device ~~and wherein the image of the contents of the source device includes a plurality of~~  
14 ~~files and a file directory of the source device;~~

15           using the database, tracking attributes and location of the at least one object in the  
16       database;

17           using the at least one object, restoring the contents of the source volume of the  
18       source device from the at least one object to at least one record of a target file in a file  
19       system stored on a storage device instead of to a volume being operated as a volume by  
20       an operating system so that the at least one record of the target file contains internally  
21       within said target file, image data representing said contents of the source volume device  
22       including image data representing both said plurality of files and said file system  
23       directory of the source volume within said at least one record of said target file device;  
24       ~~said file system comprising a plurality of files and an address table identifying the~~  
25       ~~location of each file on said storage device;~~

26           using an operating system, using the target file as a file instead of a volume so  
27       that the target file is not operated as a volume by an operating system; and

28           copying image data representing the ~~restored~~ contents of the source volume device  
29       from the at least one record of the target file to a target volume of a target device so that  
30       the target volume device contains the restored contents of the source volume device  
31       including said plurality of files of the source volume device and said file system directory  
32       of the source volume device; and

33           using an operating system, operating the target volume as a volume, including  
34       using said operating system, locating said user files in said target volume using said file  
35       system of said target volume so that the target volume is operated as a volume instead of  
36       a file by an operating system.

1           38. (previously presented) The article of manufacture of claim 37 wherein the  
2       target file is stored on storage media at a second client station.

1           39. (currently amended) The article of manufacture of claim 37 wherein the  
2 target file is a flat file which contains in a single record of the flat file the image data  
3 representing the complete contents of the source device.

1           40. (previously presented) The article of manufacture of claim 37 wherein the  
2 data storage subsystem includes a server coupled to the first client station by a network.

1           41. (previously presented) The article of manufacture of claim 37 wherein the  
2 operations further comprise:  
3           using the at least one object, restoring the contents of the source device from the at  
4 least one object to a target device so that the target device contains the contents of the  
5 source device.

1           42-44. (cancelled)

1           45. (previously presented) The article of manufacture of claim 37 wherein the  
2 operations further comprise:  
3           mounting the source device as a read only device wherein write operations to said  
4 source device are prevented during said backing up of said source device.

1           46. (previously presented) The article of manufacture of claim 37 wherein said  
2 target file is a flat file.

1           47. (previously presented) The article of manufacture of claim 37 wherein said  
2 copying uses the UNIX dd command.

1           48. (currently amended) A subsystem for managing data for use with a plurality  
2 of client stations coupled together by a network, said client stations including a source

3 client station having a source device and a target client station having a target device,  
4 each source device having a source volume which includes storage, a plurality of user  
5 files stored in said storage and a file system for locating said user files stored in said  
6 storage, said file system including an address table identifying the location of each file on  
7 said storage device storing a file system comprising a plurality of files and an address  
8 table identifying the location of each of said plurality of files, comprising:

9 a data storage device having a database comprising a plurality of objects;  
10 a digital data processing apparatus coupled to the storage device, wherein the  
11 digital data processing apparatus includes an operating system and is programmed to  
12 perform ~~a data management method~~ operations method, said ~~method~~ operations  
13 comprising:

14 using the operating system, operating a source volume of a source device  
15 including said operating system locating said user files in said storage using said  
16 file system and said address table of said file system;

17  
18 backing up contents of a the source volume of the source device at a source  
19 client station as at least one object of said database stored in said data storage  
20 device wherein the at least one object represents an image of the contents of the  
21 source volume of the source device and wherein the image of the contents of the  
22 source device includes a plurality of files and a file directory of the source device;

23 using the database, tracking attributes and location of the at least one  
24 object in the database;

25 using the at least one object, restoring the contents of the source volume of  
26 the source device from the at least one object to at least one record of a target file  
27 in said file system stored on a target device of a target client station instead of to a  
28 volume being operated as a volume by an operating system so that the target file  
29 contains internally within said at least one record of said target file, image data  
30 representing said contents of the source volume device including image data

31 representing both said plurality of files and said file system directory of the source  
32 volume within said at least one record of said target file device;  
33 using an operating system, using the target file as a file instead of a  
34 volume so that the target file is not operated as a volume by an operating system;  
35 and  
36 copying image data representing the restored contents of the source  
37 volume device from the at least one record of the target file to a target volume of  
38 a target device of a target client station so that the target volume client station  
39 contains the restored contents of the source volume device including said plurality  
40 of files of the source volume device and said file system directory of the source  
41 volume device; and  
42 using an operating system, operating the target volume as a volume,  
43 including using said operating system, locating said user files in said target  
44 volume using said file system of said target volume so that the target volume is  
45 operated as a volume instead of a file by an operating system.

1 49. (previously presented) The subsystem of claim 48 wherein the target file is  
2 stored on a target device of a target client station different from said source client station.

1 50. (currently amended) The subsystem of claim 48 wherein the target file is a  
2 flat file which contains in a single record of the flat file the image data representing the  
3 complete contents of the source volume device.

1 51. (previously presented) The subsystem of claim 48 wherein the digital data  
2 processing apparatus includes a server coupled to the first client station by said network.

1 52. (currently amended) The subsystem of claim 48 wherein said operations  
2 ~~method~~ further comprise ~~comprises~~:

3 further comprising, using the at least one object, restoring the contents of the  
4 source device from the at least one object to a target device so that the target device  
5 contains the contents of the source device.

1 53-55. (cancelled)

1 56. (currently amended) The subsystem of claim 48 wherein said operations  
2 ~~method~~ further comprise ~~comprises~~:

3 mounting the source device as a read only device wherein write operations to said  
4 source device are prevented during said backing up of said source device.

1 57. (previously presented) The subsystem of claim 48 wherein said target file is a  
2 flat file.

1 58. (previously presented) The subsystem of claim 48 wherein said copying  
2 uses the UNIX dd command.

1 59. (currently amended) A data management method, comprising:  
2 using an operating system, operating a source volume of a source device wherein  
3 the source volume includes storage, a plurality of user files stored in said storage and a  
4 file system for locating said user files stored in said storage, said file system including an  
5 address table identifying the location of each file on said storage device, said operating  
6 including said operating system locating said user files in said storage using said file  
7 system and said address table of said file system;

8 mounting a the source device as a read only device wherein write operations to  
9 said source device are prevented during backing up of said source device;

10 backing up the complete contents of ~~said~~ the source volume of the source device  
11 at a first client station as at least one object of a database stored in a data storage  
12 subsystem which includes a server coupled to the first client station by a network wherein



13 the at least one object represents an image of the contents of the source volume of the  
14 source device ~~and wherein the image of the complete contents of the source device~~  
15 ~~includes a plurality of files and a file directory of the source device;~~  
16 using the database, tracking attributes and location of the at least one object in the  
17 database;  
18 determining that a target device is not available;  
19 in response to said determination that said target device is not available, using the  
20 at least one object, restoring the contents of the source volume of the source device from  
21 the at least one object to a single record of a flat target file in a file system stored on a  
22 storage device at a second client station instead of to a volume being operated as a  
23 volume by an operating system so that the single record of the flat target file contains  
24 internally within said single record of the flat target file, image data representing said  
25 complete contents of the source volume device including image data representing both  
26 said plurality of files and said file system directory of the source volume device within  
27 the contents of the single record of the flat target file, ~~wherein said file system~~  
28 ~~comprises a plurality of files and an address table identifying the location of each file on~~  
29 ~~said storage device;~~  
30 using an operating system, using the flat target file as a file instead of a volume so  
31 that the flat target file is not operated as a volume by an operating system; and  
32 copying image data representing the ~~restored~~ complete contents of the source  
33 volume device from the single record of the flat target file using the UNIX dd command  
34 to a target volume of said target device when available so that the target volume device  
35 contains the complete restored contents of the source volume device including said  
36 plurality of files of the source volume device and said file system directory of the source  
37 volume device; and  
38 using an operating system, operating the target volume as a volume, including  
39 using said operating system, locating said user files in said target volume using said file

- 40 system of said target volume so that the target volume is operated as a volume instead of  
41 a file by an operating system.